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Chapter 06 - Web Literacy

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Web Literacy

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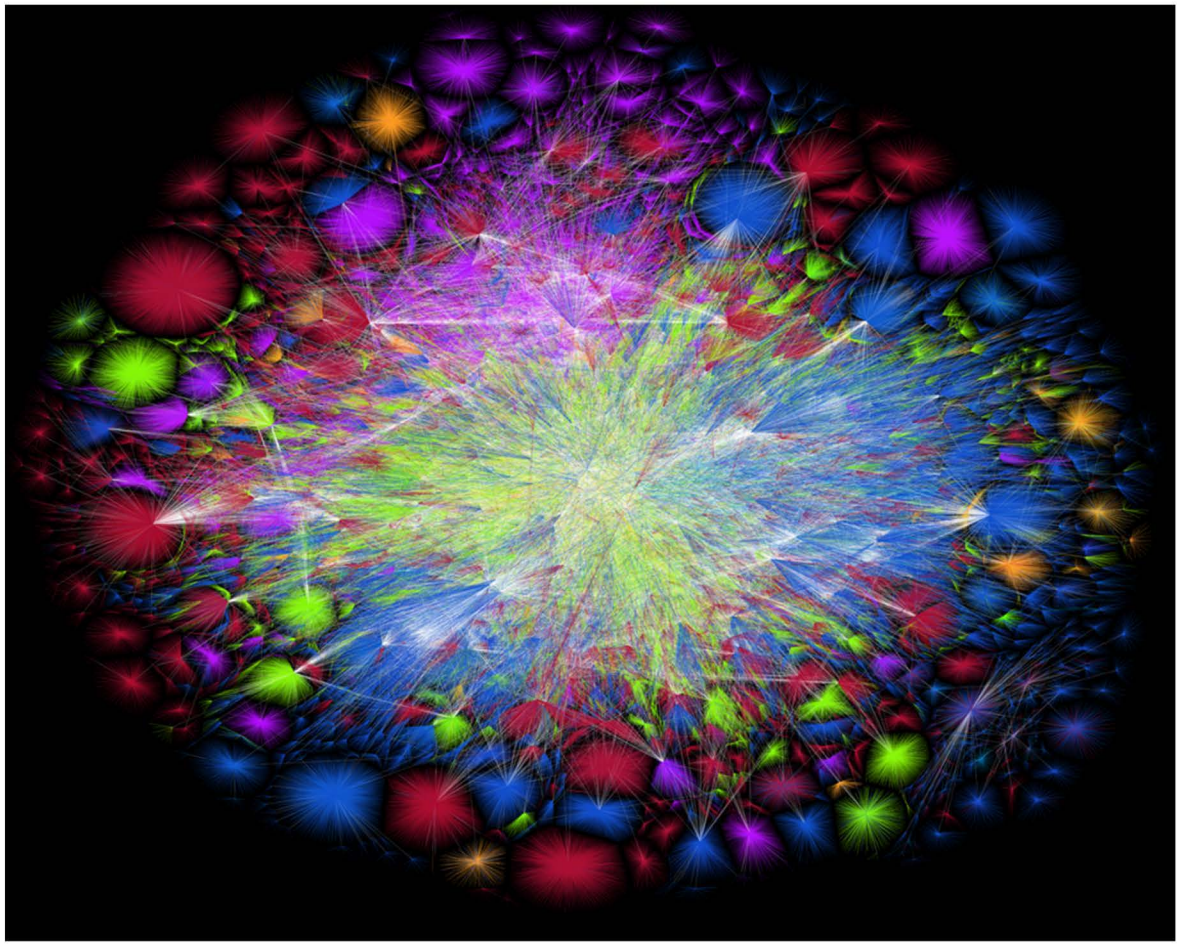
The Web is ubiquitous. It's a part of our lives: We conduct much of our social, financial, and educational activities online these days. Thus, it's important to understand how the web works; how to evaluate information sources found on the World Wide Web; and to understand how some people have more access to — and thus more opportunity to contribute to — the Web.

As we move forward, perhaps it's helpful to look at a visual concept of the Internet (and the content shared through the information space called the World Wide Web). Artist Barrett Lyon created his first conceptual map of the Internet in 2003, which was based upon Internet Protocol (IP) addresses. The purpose was to convey the interconnected nature of this global network, and the sheer volume of these connections.

Figure 1.1 "The Internet 2015." Barrett Lyon (http://www.blyon.com/blyon-cdn/20150711.coords_1000x800.png)



Some Definitions for Understanding the Web

- **World Wide Web:** An "...information space…" which houses documents and resources. Outlined by Sir Tim Berners-Lee in this proposal in 1989, the World Wide Web technologies include URLs, hyper-text mark-up language (HTML), and HTTP (W3C 2016).
- **Internet**: "The Internet is a global system of interconnected computer networks that interchange data by… using the standardized Internet Protocol Suite..." (Internet History).
- **Web 1.0**: Refers to both a method and practice of presenting content to users on the Web. Web 1.0 concentrated on presenting information to users, not co-creating with users. Since user-generated content was not available, participation between creators and audience was rather limited (Cormode & Krishnamurthy 2008).

  Sample of a Web 1.0 website? A top-down hierarchy such as a site map.
- **Web 2.0**: As much a concept as a practice, a Web 2.0 site allows users to interact and collaborate with each other in a virtual dialogue as co-creators of user-generated content in a virtual community. This transformation is in direct contrast to websites where users were limited to the passive viewing of content that was created for them (Cormode & Krishnamurthy 2008).

  Sample of a Web 2.0 website? A peer-to-peer structure such as Yelp.com.

Web Literacy

Now that you have a conceptual understanding of the Internet and the World Wide Web, let's explore how we discover, retrieve, and evaluate online information. The library profession often adopts profession-wide standards authored by the Association of College and Research Libraries (ACRL) in order to effectively and consistently teach web literacy skills to undergraduates. Web literacy is a combination of (at least) two skill sets, information literacy skills *and* fluency or competency in using information technology. Let's break that down: Information literacy "...requires individuals to recognize when information is needed and have the ability to located, evaluate, and use effectively the needed information" (ACRL 2012). Essentially, an information literate individual is able to search for, retrieve, and evaluate information for a specific purpose. Technological competency, which can also be called information technology skills, "...enables an individual to use computers, software applications, databases, and other technologies to achieve a wide variety of academic, work-related, and personal goals" (ACRL 2012).

Think about what activities you do while online. How often do you conduct a Google search? Or post on Instagram, Twitter, or SnapChat? Complete online banking tasks? These seemingly simple actions force you to complete a series of tasks that require a combination of information literacy and technological competency skills. Refer to the examples below to see how information literacy and technological competency are inextricably linked. *Note*: Information literacy skills are highlighted in **blue** while technology competency are outlined in **green**.

a) **Google Search**:

- **Select** a device to use (such as a desktop or a mobile device);
- **Use** the device to connect to the Internet;
- **Open** an Internet browser and **navigate** to the Google search engine;
- **Understand** what information you need, and **employ** the right search terms to get useful results;

- **Evaluate** your search results for your information needs;
- **Synthesize** your discovery of information into an actionable result (i.e., answering a question).
- **Close** the browser.

b) **Online Banking**:

- **Select** a device to use (such as a desktop or a mobile device);
- **Use** the device to connect to the Internet;
- **Open** an Internet browser (such as Safari or Chrome), and **navigate** to the bank website to sign into the online banking system;
- **Orientate** yourself to the online banking interface, and **identify** what actions are necessary for you to complete your banking task;
- **Complete** the task, and **verify** the success;
- **Sign** out from the online banking system, and **close** the browser.

By examining the steps involved in each of these tasks, you can begin to understand why web literate individuals need both information literacy skills *and* technological competency. Thus far, we have discussed the differences between the World Wide Web and have explored the concepts of web literacy. But there are two features on the Web landscape that students use frequently, and thus bear further examination: Google and Wikipedia.

Google Search

Like the Web, Google is ubiquitous. So it is doubly important to understand how Google works. Google is primarily a search engine, and these tools are designed to provide answers in response to submitted search queries. When a person looks for a document on the Web, search engines to scour all known documents and do two things:

1. Retrieve only relevant and/or useful results; and
2. Rank those results in order of *perceived* usefulness.

Google is both a search engine (as are other sites, such as AltaVista, Bing, Yahoo!, etc.) and an indexing powerhouse. Google does two main tasks very well: A) Crawling and building an index, and B) providing search results by calculating relevancy. Let's start with crawling. What *is* it? Pause for a moment, and imagine the World Wide Web as a city map. Each location on this map is its own unique document (usually a web page, but sometimes a PDF, JPG or other file). In order to discover these locations for future reference, the search engines need to "crawl" across the entire map and find all the locations along the way (using the best path available – hyperlinks). These links then create a map for that the engine memorizes. Crawling the web, alongside with indexing the discovered content, allows the creation of links between the billions of documents, pages, files, news, videos and media on the world wide web. This is tied to the second function of search engines — which is to provide search results ("Crawling & Indexing" 2016). It is important to recognize that as vast as these "maps" are, search engines will never be able to index every document on the web…

Crawling and indexing directly inform how search engines operate. This poses an fascinating question: How do search engines determine what is useful? Currently, the search engines operate by popularity. The engines interpret importance as popularity – the more popular a site, page or document, the more valuable the information contained therein must be.

What does that mean for relevancy? Google states that they measures relevancy through a combination of over 200 independent factors. A well-known factor is called PageRank, which is a link analysis algorithm. This means that websites with that link to another one get higher results because the algorithm reads it as a quality metric ("How Google Search Works").

Figure 1.2 How to Maximize Google Search

Options to refine your search include:

synonyms	use ~ (the tilde symbol) immediately before a search term to include synonyms	**~tourism**
"phrase searching"	use quotation marks around phrases	**"adventure tourism"**
OR	results include *either* search term. OR must be in capital letters.	**tourism OR travel**
exclude	use – immediately before a search term you want to exclude	**tourism –wine**
include	use quotation marks around automatically excluded search terms (e.g. the, a)	**"the tourist"**
exact spelling	use quotation marks around a single search term to prevent automatic truncation	**"tour"**
intitle:	finds results with your search term in the document title	**intitle:tourism**
allintitle:	finds results with all your search terms in the document title	**allintitle:tourism adventure**
related:	finds results with content related to a specific website	**related:www.tourism.org.nz**
filetype:	limits your search results to a specific file type Examples of file types include; doc xls ppt mp4 docx pptx xlsx	**filetype:pdf**
site searching	limits your search to searching within a specific site	**site:www.library.otago.ac.nz**
domain searching	limits your search to a specific domain Examples of domains include;	**site:govt.nz**

Site	*New Zealand*	*Australia*	*United Kingdom*	*America*
Commercial	co.nz	com.au	co.uk	com
Not for profit	org.nz	org.au	org.uk	org
Academic/Educational	ac.nz	edu.au	ac.uk	edu
Government	govt.nz	gov.au	gov.uk	gov

link:	use to see what sites link to a specific website	**link:www.library.otago.ac.nz**
define:	find definitions sourced from a range of online resources	**define:tourism**
search preferences	select options from 'Search settings' to set your search preferences	**e.g. language**

Another set of tools available to you is the Google Suite. The Google Suite is a collection of search engines that are organized by information type. This means that each search engine has an established search result filter as a default setting, and will only retrieve results according to the desired format. The title of the search engine indicates what format is sought and retrieved. For example, Google Books will retrieve results found in Books, and Google News will likewise retrieve news-related results. One search engine particularly useful for students and faculty is Google Scholar (https://scholar.google.com/). Google Scholar describes itself as such:

> "Google Scholar provides a simple way to broadly search for scholarly literature. From one place, you can search across many disciplines and sources: articles, theses, books, abstracts and court opinions, from academic publishers, professional societies, online repositories, universities and other web sites. Google Scholar helps you find relevant work across the world of scholarly research" ("About Google Scholar").

Wikipedia

Wikipedia is a free, general encyclopedia that has been available online since 2001. One of this unique resource's most significant strengths can also be its most significant weakness. That is, anyone can create, add, or edit entries on Wikipedia. This large contributor base results in numerous people available to edit and add to entries on subjects they are most knowledgeable about, giving Wikipedia, with over 5 million entries, a breadth that many print general encyclopedias don't have.

As a result, Wikipedia is often a good **starting place** for research projects. Consider the start stage in the research process. At this stage, it is important to gather information about the topic you are investigating. As a general encyclopedia that is continuously updated, Wikipedia may very well have the latest information about your topic of choice. Additionally, there may be clues in the text to help move your research forward. For example, if the research topic at hand is the recently discovered Proxima Centauri b, there are a number of things that may be helpful in the first few paragraphs. It may be useful to learn more about **exoplanets** to better understand the topic, to learn about what the **habitable zone** of a star is to understand the importance of the discovery, or determine

where Proxima Centauri is in relation to Earth. These links in the image below serve as starting points to expand research on the topic and garner greater understanding.

Proxima Centauri b

From Wikipedia, the free encyclopedia

Proxima Centauri b (also called **Proxima b**[7][8]) is an exoplanet orbiting within the habitable zone of the red dwarf star Proxima Centauri, the closest star to the Sun.[9][10] It is located about 4.2 light-years (1.3 parsecs, 40 trillion km, or 25 trillion miles) from Earth in the constellation of Centaurus. It is the closest known exoplanet to the Solar System and the closest potentially habitable exoplanet known.

In August 2016, the European Southern Observatory announced the discovery of the planet, sparking enormous media coverage.[1][11][12][9][13] Shortly after the discovery, researchers investigating the habitable potential of Proxima b suggested that the exoplanet may be the nearest possible location for life beyond our solar system.[1] Researchers believe that its proximity to Earth may offer an opportunity for robotic exploration of the planet in the future.[7]

The planet was found using the radial velocity method, where periodical Doppler movements of spectral lines of the host star suggest an orbiting object. From these readings, the component of its velocity relative to the Earth is about 5 km/h (3 mph).[1]

(Figure 1.3 – screenshot of Proxima Centauri b entry from Wikipedia. Used under a Creative Commons Attribution-ShareAlike License.)

It is considered good practice on Wikipedia to provide citations for information found in entries. As a result, many entries - such as the Proxima Centauri b entry - include numerous references and even external links to further information and resources. As with citations in other sources, these references and links can be utilized to help the researcher verify the information in the Wikipedia entry, gather further information, and gain a better understanding of the topic at hand.

(Figure 1.4 – Screenshot of Proxima Centauri b entry from Wikipedia. Used under a Creative Commons Attribution-ShareAlike License.)

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3. ^ a b Ségransan, D.; Kervella, P.; Forveille, T.; Queloz, D. (2003). "First radius measurements of very low mass stars with the VLTI". *Astronomy and Astrophysics*. **397** (3): L5–L8. arXiv:astro-ph/0211647. Bibcode:2003A&A...397L...5S. doi:10.1051/0004-6361:20021714. Find it!
4. ^ Demory, B.-O.; Ségransan, D.; Forveille, T.; Queloz, D.; Beuzit, J.-L.; Delfosse, X.; Di Folco, E.; Kervella, P.; Le Bouquin, J.-B. (October 2009). "Mass-radius relation of low and very low-mass stars revisited with the VLTI". *Astronomy and Astrophysics*. **505** (1): 205–215. arXiv:0906.0602. Bibcode:2009A&A...505..205D. doi:10.1051/0004-6361/200911976. Find it!

However, as stated earlier, anyone can edit Wikipedia. There have been a host of controversies over the years about editing Wikipedia pages, ranging from unfortunate mistakes, to contrived hoaxes to outright vandalism. For example, in 2013 it was discovered that Wikipedia editors were moving female authors from the category "American Novelists" to the category "American Women Novelists". While the stated reason for the changes by Wikipedia editor was that the category was too long - a seemingly valid reason for such edits on a category with over 3,000 entries -

as Filipacchi, the author to first note the changes, pointed out there wasn't a subcategory for "American Men Novelists" (2013). As disconcerting as this type of erasure of representation may be - would people looking at such a list even notice the lack of representation as they looking for inspiration for their next read, not realizing there was a subcategory to look through as well - perhaps even more concerning was the "revenge editing" of Filipacchi's wikipedia page in response. An investigation of the changes led primarily to one particular editor, Qworty, who was eventually unmasked as utilizing his editing privileges on Wikipedia to further petty squabbles and spread false information about rivals (Leonard, 2013a, Leonard 2013b).

As Kathleen Geier states, in response to the Qworty controversy, "anyone possessing enough time and resources, and who is obsessed enough, can post information on the site that is false, misleading, or extremely biased" (2013). False information originating from Wikipedia has made its way into mainstream media on more than one occasion (Cohen, 2009; Sack, 2010), showing how necessary it is to verify the information found there. This makes following up on the entry citations and utilization of other resources very important, and illustrates why Wikipedia should function as a starting point during the research process, never an ending point.

The Digital Divide

Equitable access to emerging technology isn't only a post-Electronic Age problem. Well before the invention of computers or information and communication technology (ICT), there are several instances of entire groups that failed to receive any of the social, financial, or educational benefits associated with a transformative communications technology because they lacked equitable access. One example? The invention of the Gutenberg printing press. In 1436 Johannes Gutenberg designed a machine that used a re-usable typeset. Because of the speed and mobility afforded by this innovation, Gutenberg could print pages of text at an incredibly rapid rate — certainly faster than his contemporaries. In hindsight, it is clear that Gutenberg's printing press transformed European society in many ways. Demand for both religious and non-religious – fiction, memoir, natural history – texts grew. Furthermore, the printing press spawned a socio-economic transformation: an entire industry dedicated to printing and press needs. Lastly, the printing press prompted the circulation of, and participation in, ideas throughout society through the new ubiquity of printed materials ("Gutenberg's legacy" 2016). However, there was a drawback: Impoverished individuals still didn't have much access to printed texts, and thus could not participate in the increased circulation of ideas, because of illiteracy. They further lacked the financial means and the opportunity to seek an education that would allow them to participate in this socio-economic and cultural transformation.

Several centuries later, we are in the midst of another technological and cultural transformation: The Computer Age. Given its global impact upon our financial, cultural, educational, and communications landscape, some have referred to the advent of personal computing, the Internet, and World Wide Web as a Third Industrial Revolution or the knowledge economy (Britz 192; "The Third Industrial Revolution" 2012). By the mid-1990s, increasing numbers of households who owned a personal computer. Government surveys and polls on access to information and computing technology revealed that several specific populations did not have equitable or consistent access computer technology (Brown, Barram & Irving 1995). These groups included impoverished households; historically underrepresented / oppressed racial and ethnic groups; elderly individuals; people who live in rural / under-connected areas; and people with disabilities. With significant evidence demonstrating this technological disparity, the phrase "The Digital Divide" was coined. The exact origin of the term is unknown, but the phrase was adopted and became vastly popular, due to efforts of high-ranking US government officials within the Clinton Administration. Here is one definition: "The digital divide refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information ….and to their use of the Internet for a wide variety of activities" (Boswell 2011).

Very few people could predict the many ways that the Internet would completely reorganize socio-economic relationships across the world. Thus, the term "The Digital Divide" was initially used to simply describe access (or a lack thereof) to computers. Currently, this definition has evolved to describe the need for access to ICT and the skills to effectively use computing and information technology (Lynch 2002). Originally, the Digital Divide phenomenon was framed as a series of obstacles that specific populations faced. In her work Virtual Inequality: Beyond the Digital Divide, scholar Karen Mossberger outlines these obstacles around a useful framework:

- **The Access Divide**: Access refers to the opportunity to simply use a computer and information technologies. Further considerations to examine when discussing access to ICT include individual access, and frequency of access, to a computer and the World Wide Web. Also, it is important to consider whether the computer is a personally owned device within the home, or a public device (Mossberger pg. 15).
- **The Skills Divide**: The Skills Divide concept addressed how individuals use computers, and includes two elements: Technological competence (which is the ability to operate computing and personal devices) and information literacy (which is the ability to recognize when information is needed and to locate, evaluate and use effectively that information). For the former skillset, these skills can vary from turning the computer on to effectively using different types of software; for the latter, these skills can range to conducting a simple Google search to effectively managing an entire research experience (Mossberger pg. 38).
- **The Economic Opportunity Divide**: As mentioned before, some writers identify the current (post-Internet) era as the "Third Industrial Revolution" because of the focus on digital technology and ICT. While this new industry provides incredible socio-economic opportunities for some, the ability to seek out and capitalize upon these opportunities are contingent upon an individual possessing several skills: technological fluency, information literacy, *and* attitudes toward / confidence in using computer skills within a job setting. Both attitudes towards computer technology and actual skill set have real ramifications for an individual's income and prospective employability — which, in turn, impact economic

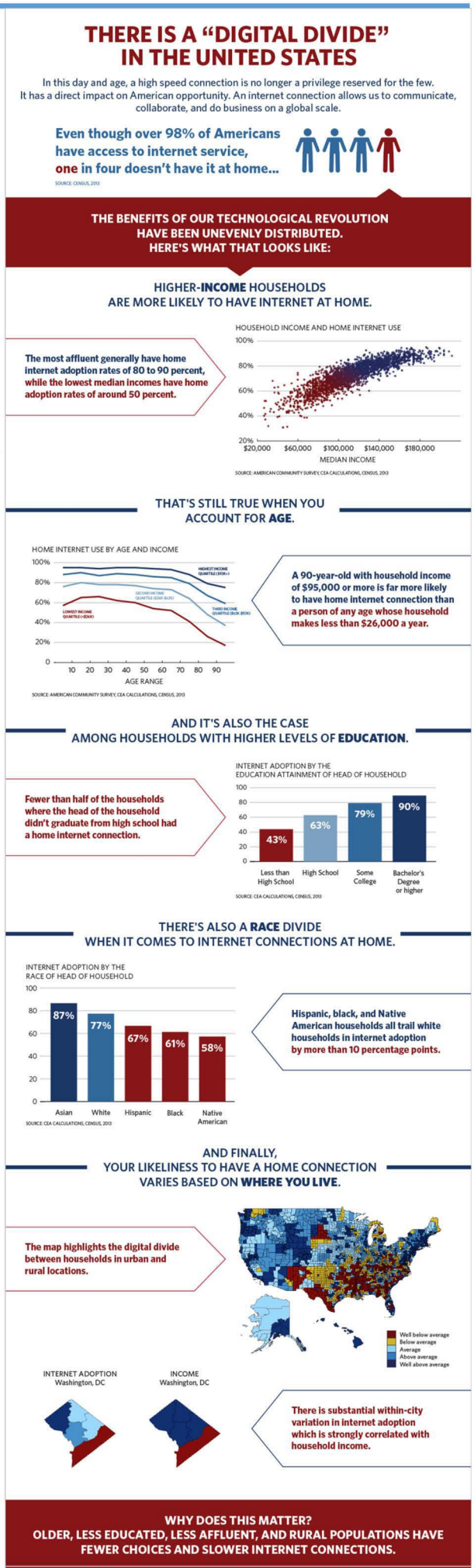

Figure 1.5 Digital Divide Infographic from White House. Gov

opportunity and the possibility to subsist above the poverty level. Currently there are significant economic opportunity disparities that exist across gender lines, education level, and ethnic groups (Mossberger pg. 61).

- **The Democratic Divide**: Computer and information technologies influence the way individuals interact with the government. Increasing levels of government information, especially voting and candidate materials, are only available online. Individuals who successfully access this information will have consistent access to the World Wide Web, basic technological competence, and some information literacy skills. However, many individuals still lack these requirements and thus, cannot equally participate in the increasingly digitized political process (Mossberger pg. 87).

What does all of this *mean*? The Web is an information source *and* a cultural platform on which knowledge is disseminated, exchanged, and transformed. But the Digital Divide phenomenon means that some groups experience less opportunity to participate in, and to share their ideas and knowledge within, this dialogue. In essence, the groups with high levels of education, money, and technological skill are ostensibly most comfortable, and have the greatest amount of opportunity, in using electronic technology to participate in the cultural, economic, political, and educational landscape that is the World Wide Web. Those groups *without* the same levels of the aforementioned "capital" are less able to participate because they simply don't have the same level of access, skillsets, and opportunities.

Chapter Conclusion: Why is this important to you?

In this chapter, you have discovered the difference between the Internet and the World Wide Web; you have learned the basics about web literacy; explored how Google Search operates and retrieves results; discussed when and how to use Wikipedia; and learned about the Digital Divide phenomenon. To reiterate, the Web is an information source *and* a cultural platform on which knowledge is disseminated, exchanged, and transformed. However, the complexity of the Web requires skills and unique knowledge in order to effectively navigate, search for, retrieve, and evaluate documents.

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